The Promise of Digital Solutions for Improving Healthcare Value

By Angel Valladares, M.P.H., and Meggie Hotard, M.P.H.

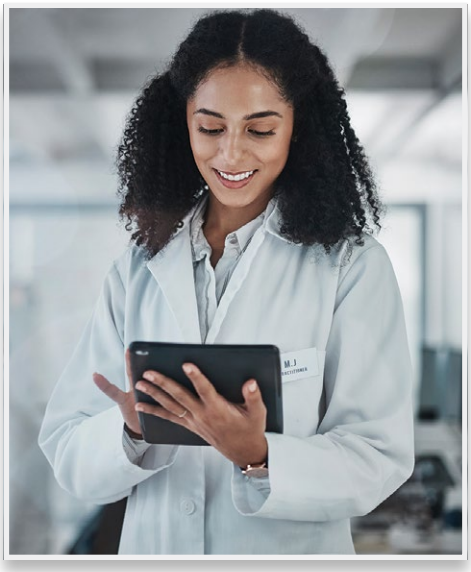
Over the past 10 years, a shift away from traditional healthcare models has included the adoption of digital health solutions to tackle long-standing challenges. Major healthcare sector disruptions including shifting patient expectations, venture capital investment into healthcare, and reimbursement policies encouraging digital adoption have accelerated this trend. However, not every digital solution is made equal. As a result, hospital and health system boards and senior leaders should scrutinize the value of adopting these technologies as part of system innovation.

Market Pressures Driving Digital Health Adoption

While consumerism has been a buzzword in the industry for years, recent drivers have expanded its role, influencing stakeholders to prioritize patient-centricity. For instance, recent government policies on price transparency now require hospitals to publish pricing information for the first time. Regardless of where one stands on the issue, it's undoubtedly a message that policymakers wish to see more marketplace dynamics in healthcare.[1] This includes providing patients the opportunity to shop around like they would for any other service. Moreover, patient care delivery preferences are also impacted. For example, 58 percent of all U.S. adults don't just prefer telemedicine but are "excited" to use the technology in a future visit. The end of 2022 saw an encouraging turning point for telemedicine as the number of U.S. adults who have had a prior experience (48 percent) pulled even with those who have not (48 percent). Back in 2019, only 10 percent of U.S. adults cited a past experience.[2] Younger generations (born after Generation X) are especially enthusiastic about telehealth—70 percent prefer the convenience of telehealth, and 44 percent of Gen Z and millennials would switch providers if telehealth services were unavailable.[3]

The COVID-19 pandemic accelerated digital health adoption by driving digital health reimbursement and payment reforms. To address the need for remote urgent care services, CMS approved reimbursement of telehealth services, encouraging widespread adoption and utilization. Despite the pandemic spike in telehealth mostly fading,[4] CMS has expanded reimbursement to support technologies like remote patient monitoring and digital therapeutics, among others.

Mirroring the record-setting private investments in the healthcare sector towards the end of the previous decade, 2021 was a record-setting year with U.S.-based digital health startup investments reaching nearly $30 billion.[5] The near-halving of investment in 2022 ($15.3 billion), was still an eightfold increase from 10 years earlier.[6] While funding has cooled down from pandemic highs, health-related mobile applications available to consumers now surpass 350,000 worldwide.[7]



Key Board Takeaways

- While there are many digital solutions promising incredible benefits to the system, each new adoption should be evaluated for their fit with the organization's needs and validation of their expected value propositions.
- The end-goal of digital transformation is not a digital device or technology product, such as a patient portal. Ideally transformation initiatives focus beyond the technology to develop an innovative business model that advances an organization's culture, processes, and policies.
- When implementing new digital solutions and collecting more data, it is important that organizations take security and privacy precautions to protect patients' data, particularly sensitive information such as medical or financial data.
- Providers are already facing extreme burnout, especially after the pandemic. Therefore, it is important that potential solutions make providers' lives easier and do not aggravate burnout.

> "The broad scope of digital health includes categories such as mobile health (mHealth), health information technology (IT), wearable devices, telehealth and telemedicine, and personalized medicine."
>
> *—FDA, "What Is Digital Health?"*

Setting the Bar for Digital Health Solutions

The digital health investment boom outpaced traditionally slow-moving policymakers. While the FDA regulates device software functions under certain criteria,[8] most apps that are meant to be used only for monitoring and recording symptoms for general fitness, health, or wellness, and not treating disease, are not regulated. Most mobile health apps available focus on general wellness, but the number of apps for health condition management are increasing. For those under regulation, many are considered

1 Centers for Medicare & Medicaid Services, "Hospital Price Transparency," 2022.
2 NRC Health's Market Insights national survey of consumers, October–December 2022, n size = 75,077.
3 American Hospital Association, "There May Be a Generation Gap in Telehealth's Future," June 29, 2021.
4 Sanjula Jain, "Telehealth Demand Continues to Decline, Posing Challenges for Telehealth Providers and Policymakers," Trilliant Health, August 14, 2022.
5 Kyle Bryant, Madelyn Knowles, and Adriana Krasniansky, "2022 Year-end Digital Health Funding: Lessons at the End of a Funding Cycle," Rock Health, January 9, 2023.
6 Suhas Gondi and Zirui Song, "The Burgeoning Role Of Venture Capital In Health Care," *Health Affairs,* January 2, 2019.
7 Murray Aitken and Deanna Nass, *Digital Health Trends 2021: Innovation, Evidence, Regulation, and Adoption,* IQVIA Institute for Human Data Science.
8 U.S. Food & Drug Administration, "Device Software Functions Including Mobile Medical Applications," September 29, 2022.

low risk by the FDA and are regulated at FDA's discretion.[9]

By contrast, digital therapeutics (DTx) are more tightly regulated, requiring a formal development path involving premarket evidence submission for FDA review of safety and efficacy. In addition, most prescription DTx, with some exceptions, require a prescription to be dispensed and/or reimbursed.[10]

To better align evidence requirements between regulated and non-regulated digital health tools, providers are essentially "on their own" to evaluate the impact of most non-regulated solutions. Therefore, hospital and health system boards and senior leaders should develop a thoughtful strategy on how to evaluate solutions and monitor quality and outcomes for providers and patients respectively.

Assessing Digital Health Solutions Using the Quadruple Aim

When thinking of digital health solutions that deliver value, the four dimensions of the Quadruple Aim serve as a straightforward guide: improved provider experience, improved patient experience, better outcomes, and lower costs. Given the sheer volume of applications, below are four example use cases that speak to the Quadruple Aim.

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Improved Provider Experience

While our understanding of the relationship between provider experience and patient outcomes is limited, provider burnout does contribute to quality of care.[11] There are promising digital health solutions that may address provider burnout issues and subsequently increase provider satisfaction. One example is described below:

- **Use case**: Natural language processing (NLP)-based apps to address provider burnout
- **Benefits**: While providers have used medical scribes to assist in clinical documentation, in recent years, AI-based EHR scribing services have increased in use. Providers dictate via voice input devices during patient encounters, the recording is then translated to the provider's progress notes.[12] This solution intends to refocus provider documentation time to patient care.
- **Considerations**: Even human-based scribing has had mixed impact on care delivery efficiencies,[13] with some benefits to patient and provider experience. Therefore, tech-based solutions with the same end goal should be further evaluated to assess non-inferiority.

Improved Patient Experience

Digitalization of other industries like banking, transportation, and retail has both improved the consumer experience and increased their expectations. Healthcare is undergoing a similar transformation as system leaders implement techniques to improve patient experience. Remote patient monitoring (RPM) is a promising technology for improving patient experience during follow-up:

- **Use case**: RPM for reducing patient travel to clinical facilities and wait times
- **Benefits**: Sharesource is an RPM platform for end-stage renal disease that allows providers to monitor their patient's home dialysis treatments, and then remotely adjust therapy without the need for patients to make unplanned visits to the clinic.[14]
- **Considerations**: Challenges with RPM include training and having staff available to monitor and manage the incoming data. Other issues identified have been security concerns, data accuracy, and patient compliance with engagement.

Obstacles to Digital Health Adoption

Additional challenges to digital health, outside of lack of clear regulation and robust evidence to facilitate trust, include:

- **Privacy and cybersecurity**: Patient data requires the highest level of security and privacy. The increasing number of data breaches and ransomware pose significant risks.
- **Healthcare interoperability**: Healthcare device data needs integration with a patient's medical history to be effective. However, linking of datasets is still messy and challenging, obscuring the understanding of clinical and social drivers.
- **Actionable data insights**: Too many point solutions provide limited information that does not reliably provide actionable next steps for users.

9 Jeffrey David Iqbal and Nikola Biller-Andorno, "The Regulatory Gap in Digital Health and Alternative Pathways to Bridge It," *Health Policy and Technology,* Fellowship of Postgraduate Medicine, September 2022.
10 Aitken and Nass, 2021.
11 Daniel Tawfik, et al., "Evidence Relating Health Care Provider Burnout and Quality of Care: A Systematic Review and Meta-analysis," *Annals of Internal Medicine,* October 8, 2019.
12 Hannah Nelson, "Artificial Intelligence (AI) Use Cases to Mitigate Clinician Burnout," EHR Intelligence, January 4, 2023.
13 Heather Heaton, et al., "Effect of Scribes on Patient Throughput, Revenue, and Patient and Provider Satisfaction," *The American Journal of Emergency Medicine,* July 28, 2016.
14 Baxter Corporation, "Baxter Highlights New Home Dialysis and HDx Therapy Data in 14 Clinical Presentations at Kidney Week 2022" (press release), November 8, 2022.

Better Health Outcomes

- **Use case**: Wearable-supported platforms for chronic disease management
- **Benefits**: One Drop is a mobile platform offering care management for people with diabetes. The platform includes a Bluetooth-enabled blood glucose meter, test strips, and lancets as well as a mobile app and various coaching programs. Part of its market success has been integration with activity trackers and glucose monitoring systems on mobile devices.[15] In peer-reviewed research, platform use supported sustained clinically and statistically significant reductions of 1.07–1.27 percent in HbA1c during a median of four months.[16]
- **Considerations**: One Drop received FDA clearance, which includes its companion app. However, not all health apps are regulated by the FDA or have proof that their apps demonstrate long-term improvements in user health.

Lower Costs of Care

- **Use case:** mHealth apps may provide for cost-effective patient management
- **Benefits:** A growing body of evidence supporting the cost-effectiveness of mHealth apps suggest they may be an efficient way to support health management by connecting patients to simple applications like exercise tracking, heart monitoring, and virtual coaching support.[17] These apps allow providers to reach and monitor patients on a much larger scale, while improving patient outcomes and generating cost savings.
- **Considerations:** Measuring ROI on these mHealth solutions can be tricky; for instance, in the above One Drop example, cost savings might only reflect those generated from controlling HbA1c levels but may not fully factor savings from reduced stroke or heart attack.

The Board's Role

U.S. healthcare has traditionally been more focused on the volume of services instead of being consumer or value focused.[18] However, recent market drivers have fostered a new paradigm, placing greater priority on consumer-focused solutions. In this shifting environment, the board can play an important role in organizational decision-making regarding patient-centered solutions.

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The COVID-19 pandemic accelerated the growth of digital health through shifting patient expectations, heavy digital health investment, and reimbursement changes encouraging digitalization. Boards should continue to focus their organization's digital transformation efforts on meeting these new demands for convenience and access to care. However, healthcare boards should examine the underlying evidence and value proposition of digital health solutions to better evaluate whether they will meet the necessary expectations.

The Governance Institute thanks Angel Valladares, Real World Evidence Strategy Consultant, and Meggie Hotard, Manager, Real Word Networks, at IQVIA, for contributing this article. They can be reached at angel.valladares@iqvia.com and meggie.hotard@iqvia.com.

15 Amirah Al Idrus, "Bayer Steps Up to Take One Drop's Tech beyond Diabetes, Backs $40M Round," Fierce Biotech, September 17, 2019.
16 Chandra Osborn, et al., "One Drop Mobile on iPhone and Apple Watch: An Evaluation of HbA1c Improvement Associated with Tracking Self-Care," JMIR mHealth and uHealth, November 29, 2017.
17 Andrea Gentili, "The Cost-Effectiveness of Digital Health Interventions," *Frontiers in Public Health,* August 2022.
18 Paddy Padmanabhan, "Healthcare's Newest Pivot: Consumer Identity as the Cornerstone of Digital Health," *Healthcare IT News,* July 11, 2022.